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TI Estrogen attenuates over-expression of β-amyloid precursor protein messager RNA in an animal model of focal ischemia.

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AB Cerebral ischemia is a risk factor for late onset **Alzheimer**'s disease. Since estrogen replacement therapy benefits the outcome of cerebral stroke in post-menopausal women, we designed the present study to investigate the effects of estrogen on the expression of β-amyloid precursor protein (APP) mRNA following focal ischemia in female rats. Female rats were **ovariectomized** (OVX) for two weeks. A single dose of 17 β-estradiol (E2) (100 μg/kg) was injected s.c. two hours before a unilateral middle cerebral artery (MCA) occlusion. Brain samples were harvested from ischemic core and penumbra of cortices at one hour and twenty-four hours following MCA occlusion. The expression of APP mRNA was assessed by RT-PCR. At one hour after MCA occlusion, OVX rats had a 67.9% ($p < 0.05$) increase in APP mRNA in the penumbra. E2 treatment reduced this APP mRNA over-expression by 26.3% at that region. At twenty four hours following MCA occlusion, OVX rats had increases in APP mRNA of 52.9% and 57.0% ($p < 0.05$) in the core and penumbra, respectively. E2 treatment reduced the APP mRNA over-expression by 61.0% and 48.6% ($p < 0.05$) in these two regions, respectively. These effects appeared to reflect an interaction between hormonal environment and ischemia, since in the absence of MCA occlusion, there were no significant differences in APP mRNA expression among OVX, OVX-E2 treated and intact female rats. The present study demonstrates that estrogen may have an important role in reducing the over-expression of APP mRNA following focal ischemia.

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